Homework 1: Thinking abstractly

1. An algorithm is to be written to find the optimum route between two points.

   (a) List **three** applications such an algorithm may be useful for. [3]

   (b) How has abstraction been used to reduce the complexity of these applications? [3]

2. A team of developers is working on the design and implementation of a new school timetabling system. The team has been given data that the school administration felt might be useful for this task.

   (a) Explain why it is necessary for the developers to use abstraction in solving the problem. [2]

   (b) List **five** data items that would be relevant in designing this system. [5]

   (c) List **three** data items that would be irrelevant, even though they may have been supplied by the school office. [3]

3. Police have have known for a long time that everyone's shoeprint is unique. In some areas of the UK, about 70% of suspects' shoeprints are scanned and compared with the ones left at the scene of crime.

   (a) Identify **one** similarity and **one** difference between fingerprint scanning and shoeprint scanning. [2]

(b) Give **one** reason why shoeprint scanning may be **less** effective than fingerprint scanning in catching criminals. [1]

(c) Give **one** reason why shoeprint scanning may be **more** effective than fingerprint scanning in catching criminals. [1]

[Total 20 marks]